IMPERIAL
DEPARTMENT OF AGRICULTURE
FOR THE WEST INDIES

REPORT

ON THE

AGRICULTURAL DEPARTMENT

ST. KITTS—NEVIS.

1924—25.

ISSUED BY THE IMPERIAL COMMISSIONER OF AGRICULTURE
FOR THE WEST INDIES.

1925

[Price Sixpence.]

REPORTS

ON THE

BOTANIC STATION ECONOMIC PLOTS, AND AGRICULTURAL EDUCATION, ST KITTS—NEVIS

Annual Reports on Certain Economic Experiments conducted in connection with the Botanic Station, 1900-2.

Annual Reports on the Botanic Station for the years 1901 and 1902.

Annual Reports on the Botanic Station, Economic Experiments, and Agricultural Education for the years 1902-3 to 1921-22.

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LETTER OF TRANSMITTAL

Commissioner of Agriculture—to Administrator St. Kitts-Nevis.

K. 1864.

Trinidad, 15th October, 1925.

Sir,

I have the honour to forward the Report of the Agricultural Department of St. Kitts-Nevis for the year 1924-25.

2. The Report is by Mr. Shepherd and continues on the lines of previous reports. It bears evidence of the effect of the hurricane which visited those islands in August last year.

3. I would draw special attention to the Report by Mr. Kelsick on the soils of St. Kitts which contains information which is likely to be of more than passing interest.

I have, &c.,

(Sgd.) H. M. LEAKE,

Commissioner of Agriculture
for the West Indies.

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STAFF OF THE AGRICULTURAL DEPARTMENT, ST. KITTS-NEVIS.

Agricultural Superintendent	F. R. SHEPHERD.
Assistant Agricultural Supt. with Chemical duties ...	R. E. KELSICK.
Foreman	S. D. KNIGHT.
Agricultural Instructor (Nevis)	W. HOWELL.

REPORT ON THE AGRICULTURAL DEPARTMENT ST. KITTS-NEVIS.

For the year ending March 31, 1925.

Work in the Gardens and Observations on Plants.

The general condition of the Gardens remains the same as in past years.

Very dry weather was experienced from April to June and on August 28 the severe gale that passed over St. Kitts did much damage to the older trees forming the windbreak to the east of the station. The roads also suffered to some extent, a large quantity of sand being brought down from the neighbouring hill which had to be cleared out at some expense.

The tennis courts form the chief attraction to the public, being in constant use by the various clubs who have charge of them.

Work in the Nurseries and Distribution of Plants

Attention has been given to raising plants of an ornamental and useful nature such as Palms, Crotons, roses for supplying local demands, and timber and shade trees such as Casuarina, Antigua white-wood, and Gliricidia.

The actual number of plants distributed during the year consisted chiefly of Casuarinas, Antigua white-wood, and Gliricidia.

A large number of these was used for planting at the Leper Asylum and to form a hedge round the cemetery wall at Springfield.

The six olive plants—mentioned in the report for previous years as sent to Anguilla—are reported to be doing well.

Plot Experiments at the Experiment Station at La Guerite.

Experiments with economic crops of different kinds have again been carried on at the Experiment Station at La Guerite and consist of such crops as yams, sweet potatoes, pea nuts, Guinea corn, cassava, onions, and various kinds of peas.

Experiments with varieties of sugar cane and selection of best strain of Sea Island Cotton have also necessitated much attention.

The following list indicates the distribution of cuttings and seeds from the crops grown at the Experiment Station for the year.

Sweet potatoes	Cuttings	300,000	
Elephant grass	do.	40,000	
Sugar cane	do.	66,700	
Pea nuts	Seed	70	lb.
Cotton seed	do.	1,300	,,
Onion slips	Slips	16,000	

PLOT B. (PEA NUTS).

Pea nuts of the Carolina Running variety were planted in this plot on May 28, 1924 and reaped on October 24, 1924 with a yield of 366 lb. to the plot or at the rate of 3,660 lb. per acre. This very favourable result was due to the good weather conditions in the latter part of the season,

PLOT C. (GUINEA CORN. MAZZAGUA).

Guinea corn of the Mazzagua variety was planted in this plot on July 28, on banks 4 ft. wide, 2 ft. apart on the banks. The crop was reaped in February 1925 and yielded 150 lb. clean seed or at the rate of 1,500 lb. per acre.

PLOT E. (ONIONS).

Onion slips raised from seed imported from Teneriffe, were planted in this plot on November 29 1924. The slips were planted in beds 6 inches square. They were reaped in March 1925 and yielded 1,260 lb. to the plot or at the rate of 12,600 lb. per acre.

PLOT F. (PEA NUTS).

This plot was planted in Pea Nuts Native variety on May 17 1924, and reaped on November 8 1924, with a yield of 293 lb. nuts or at the rate of 2,930 lb. per acre.

Clay peas were next planted in this plot in December 1924 and reaped in March 1925 with a yield of 50 lb. peas.

PLOT H. CASSAVA.

This plot was planted in March 1924 in ten varieties of cassava. The plants suffered badly from drought and yielded a very small return. Cuttings from these plants were again planted in Plot A. in September 15 1924, and will soon be ready for reaping.

This Plot H. is now planted in eight varieties of sweet potatoes.

Plot I. Pea nuts.

After a crop of cow peas this plot was planted in pea nuts of the Carolina running variety on May 14 1924. These were reaped in October 1924, and yielded 319 lb. nuts or at the rate of 3,190 lb. per acre.

Plot J. Yams.

This plot was, after careful preparation and manuring, planted in four varieties of yams in May 1924. The cuttings were planted in hills at a distance of 2 feet apart in rows 4 feet wide.

They were reaped on January 10 1925 yielding as follows:—

Bottle Neck Lisbon ...	260 lb. per plot.	8,700 lb. per acre.
Crop	190 „ „ „	6,300 „ „ „
Seal Top	102 „ „ „	10,200 „ „ „
Danish	45 „ „ „	4,500 „ „ „

Plot K.

This plot is planted in selected cotton seed from plants selected from previous season.

Plot L.

This plot was planted in Para peas in September 1924. The vines did well but the yield of peas was very poor. The vines were turned in and the plot planted in a variety of sweet potatoes known locally as the "Todd" vine. A large number of cuttings of this particular potato has been distributed both in St. Kitts and Nevis and are much appreciated for their good bearing qualities.

Plot M. (Sweet Potatoes).

This plot was planted in eight varieties of sweet potatoes on August 23 1924 and reaped January 31 1925 with following results.

	lb.	lb. per acre.
Spooner 1 row	25	2,750
Caroline Lee 2 rows	162	8,910
Brass Cannon 1 row	75	8,250
Hug-me-tight 2 rows	230	12,650
Montserrat Emma 2 rows ...	188	10,340
Mother Kitty 1 row	60	5,500
Sorry for the Poor 1 row	60	6 600
Harriss 1 row	73	8,030

Plot N. (Sweet Potatoes.)

This plot was planted in August 1924 in the variety of sweet potatoes known as "Todd." These potatoes were kept in the plot longer than usual so as to supply cuttings for distribution. In consequence of this, many were found over ripe and the yield was only 519 lb. to the plot or at the rate of 5·190 lb. per acre.

Peas and Beans.

Crops of peas and beans have been planted on the various plots as green dressings and to secure seed for distribution.

Elephant Grass.

The plot of Elephant grass still continues to furnish a good supply of cuttings to estates. This grass makes an excellent fodder and is well established on many estates.

GOVERNMENT COTTON FARM.

Fifty five acres of land on La Guerite estate was again planted in cotton with the object of raising the best seed for supplying the cotton growers in the Presidency.

With the kind assistance of Buckleys and Shadwell estates about 38 acres of the land was ploughed the remainder being holed and banked with the hoe.

With the first rains in March the cotton was planted in one field but owing to the lack of of moisture the seed failed to germinate and towards the end of April with good rains the whole crop was planted. The plants suffered from the dry weather in May but the rains in June made them put on much growth and when the gale and heavy rain occurred at the end of August there was every prospect of a large return. The effect of the gale and insect pests resulted in a loss of at least 60% of the crop expected, the total amount of seed cotton picked being, 24,099 lbs, which yielded 5,534 lbs clean lint and 484 lbs stained lint, a total of 6,018 lbs lint.

This cotton was shipped to England to a firm of brokers for sale but so far has not been sold.

THE TOBACCO INDUSTRY.

It is to be regretted that owing to the impossibility of disposing of the stock of cigars on hand. the limited sale of the raw tobacco, and the lack of local interest displayed by the planters, it was decided to discontinue the expenditure of any further money on this industry. The expert from Jamaica, Mr Brooks returned home after his engagement expired and the cigar roller was also returned to Jamaica. Every effort has been made to introduce the cigars into the West Indian markets and reports have been received from various firms from Antigua to Barbados as to their bad smoking quality which renders them unsaleable. A sample of the raw tobacco forwarded to England to Gillespie Bros. London was reported on as of poor quality and the price quoted was very low.

The cigars sent the British Empire Exhibition at Wembly were all sold at good prices but on the advice of the Hon. Commissioner of the Leeward Islands Section, no exhibit of cigars or tobacco was made this year.

An attempt was made to grow tobacco of a heavier type for local use at the Experiment Station, but the gale and heavy rain in August swept away the nurseries and also practically destroyed the tobacco drying house.

It is to be regretted that this industry which at first gave promise of being a useful minor industry in the Presidency should have to be given up, but the quality of the tobacco grown at the Experiment Station at La Guerite was not suitable for the manufacture of a good commercial cigar and it was not possible to get tobacco grown in other localities. A considerable stock of raw tobacco remains on hand, for which there is a very limited local demand for making the cheap class of cigars. An effort has been made to offer this in the Barbados market, but so far there has been no success.

The following table gives the number of cigars rolled of each kind, and the stock in hand on March 31, 1925.

	Londres.		1923.		Cheroots.		Common cigars.	
Number of cigars rolled ...	9,000		4,975		5,375		20,675	
Distributed for Advertisement	1,384		225		700		175	
Sent to B. E. Exhibition ...	250		125		500			
Sales	1,008	2,642	314	664	2,556	3,756	20,500	20,675
On hand at March 31 1925 ...		6,358		4,311		1,619	Nil	

Work in Connection with Insect and Fungus Pests and their Control

Sugar-Cane.

Mosaic Disease.

Careful inspections were made at different times in the originally infected areas, and no signs of the disease was met with in the Sandy Point district. One instance of the disease was found in October in advanced canes of the St. Croix seedling Sc. 12·04 which was at once destroyed. In this connection it is worth recording that Dr. M. T. Cook, Plant Pathologist of the Porto Rico Insular Experiment Station, while on a visit to St. Kitts in October 1924, visited and inspected many of the estates on the island, and expressed his pleasure and surprise at the very healthy appearance of the growing canes.

Cuttings of the St. Croix seedling have been distributed to many of the estates, and so far as can be seen there is no sign of any infection, and it would appear to be quite safe to plant this seedling, when the cuttings have been selected from healthy stock. The results obtained from this seedling at La Vallee estate during the present season, are very encouraging and it is likely that the cultivation of it will be largely extended.

Moth Borer.

This pest can be met with in every field of canes, and is exaggerated by bad weather conditions. Under normal conditions the loss from the attack of Moth Borer does not seem to be very great and generally speaking it does not seem to be on the increase.

No other insect or fungus pest, affecting sugar cane, was present in any extent to cause attention.

Cotton.

The cotton worm (*Alabama argillacea*) was very prevalent and large quantities of insecticides were used to keep them in check. This added considerably to the cost of cotton growing, the price of Paris Green being higher than for some years.

Pink Bollworm (*Pectinophora gossypiella*). This pest was not so apparent in the early planted cotton in the northern district where a good first picking was obtained without any appreciable loss. The later cotton planted in April was more severely attacked and in some instances the loss amounted to almost the entire crop.

In dealing with this pest it is imperative that cotton should be planted at the same time in every part of the island. Where this is impossible owing to weather or other conditions, it is to be expected that the later planted cotton will be more heavily infected, and more loss sustained than in the earlier planted fields.

The same precautions were taken this season for the rigid cleaning up and burning of the old cotton plants, and inspection of fields before the planting of new crops under the supervision of the Cotton Inspector.

Cotton Stainers.

These were seen in the later planted cotton, after the heavy rains of August and September, but the cotton was reaped before any actual damage was done by them.

Disinfection of Plants and Seeds.

In accordance with the provisions of the Plant Protection Ordinance No. 3 of 1907. eighty-two packets of seeds and plants were inspected at the Botanic Station and, where necessary, fumigated with carbon bi-sulphide.

Plant Legislation.

The following is the legislation in force in the Presidency, dealing with Plant Protection.

Ordinance No. 3 of 1907. Orders all plants and seeds imported to be sent to the Botanic Station, to be examined by the Officer-in-charge and disinfected where necessary.

Ordinance No. 2 of 1923. An Ordinance for the prevention and eradication of diseases and pests affecting vegetation. Plant Protection Ordinance, 1923.

Proclamation under Sec. 6 of No. 8 of 1918, of date December 16, 1924 appoints the month of January as the close season for cotton for the island of Nevis.

Proclamation of date 19th day of March 1924, appoints the 1st day of April to the 31st day of May, both days inclusive, as the close season for cotton for the island of Anguilla.

LAWS RELATING TO ANIMALS IN EXISTENCE IN ST. KITTS-NEVIS.

Order in Council of date December 16, 1924, under Ordinance No. 2. of 1917. Prohibits the landing of any foreign animal within the meaning of the Diseases of Animals ordinance 1917, and no fodder or litter coming directly or indirectly from any port in England, Scotland, Wales or Ireland, the Isle of Man or the Channel Islands; provided that, upon satisfactory proof that they have not been kept at or visited any district in which any infectious or contagious disease known to attack animals exists, and also upon examination on arrival by a Veterinary surgeon, dogs may be admitted.

Ordinance No. 2 of 1917. An ordinance to consclidate and amend the law relating to contagious diseases among animals. Appointment of Inspector; manner of dealing with animals suffering from diseases, and disinfection of infected places. Conditions under which animals may be imported.

Proclamation of date May 8th 1923, fixes the period from and between February 1st and September 30th both days inclusive, as the close season for wild pigeons.

Ordinance No. 7 of 1918. An Ordinance to make provision for the eradication of the pest known as the Cotton Stainer.

Ordinance No. 8 of 1918. An Ordinance to regulate the planting of cotton and to provide for the destruction of cotton plants.

Ordinance No. 6 of 1923. An Ordinance further to amend the Cotton Ordinance No. 8 of 1918 defining an infectious plant, and providing for the inspection of land before a new crop is planted in cotton.

Proclamation of November 16 1920. Prohibits the importation into the Presidency of sugar canes or parts of sugar canes from all countries save under license given by the Governor.

Proclamation of date July 29 1922. Prohibits the importation of all lime plants and parts of lime plants including lime fruit from British Guiana, Trinidad and Dominica.

Proclamation of date November 13 1923. Prohibits the importation of growing or sprouted coconuts from St Vincent owing to presence of Red Ring disease.

Proclamation of date May 9 1923. Declares Mosaic Disease of sugar cane to be a disease within the meaning of the plant protection Ordinance.

Proclamation of date January 21 1924. Declares the "Okra" plant an infectious plant within the meaning of the Ordinance.

Proclamation of date April 2 1925. Prohibits the importation of seed cotton or cotton seed from all countries and places outside the Presidency of St. Kitts-Nevis except on the written permission of the Governor on such terms and conditions as he may prescribe.

Proclamation of date April 2 1925. Prohibits the importation of Banana suckers save and except Banana suckers imported from the other Presidencies of the Leeward Islands, St. Vincent and Barbados.

Progress in the Chief Industries.

THE SUGAR INDUSTRY.

The export for the year 1924 was 9.699 tons grey crystals and 2,073 puncheons molasses, the produce of the St. Kitts (Basseterre) Sugar Factory.

This was a decrease on the exports of 1923 of 1,018 tons sugar.

The total value of the sugar and molasses exported was £204,705 which was a decrease on the value of sugar and molasses exported in 1923 of £74,161.

The price at which the sugar sold was £23 3. 11. as against £26 3. 7. in 1923.

The very low rainfall of the year 1923 resulted in the decreased sugar crop and had it not been for the increased yield from canes due to the improved machinery at the Sugar Factory the crop of the Presidency would not have exceeded 6,000 tons sugar. Experiments with varieties of the sugar cane have been carried on at different estates in St. Kitts and Nevis, the results of these experiments are published in a separate report prepared by the Government Chemist and Superintendent of Agriculture for the Leeward Islands.

EXPORTS OF SUGAR.

Year.	Tons.	Year.	Tons.
1900	7,494	1913	11,312
1901	12,146	1914	9,946
1902	16,624	1915	8,311
1903	13,511	1916	16,106
1904	12,225	1917	15,048
1905	12,042	1918	9,105
1906	15,191	1919	11,015
1907	14,178	1920	12,483
1908	11,044	1921	10,592
1909	12,027	1922	9,648
1910	12,510	1923	10,717
1911	11,139	1924	9 699
1912	10,554		

THE COTTON INDUSTRY.

The acreage planted in cotton for the season 1924-25 was about 4,000 acres of which 1,500 acres were planted in St. Kitts and 2,500 in Nevis. None being planted in Anguilla.

In St. Kitts, the close season being the month of February, all cotton was planted during the months of March and April.

In the northern district the germination was excellent and the weather conditions being more favourable the cotton developed early and a good first picking was obtained by end of August. In the Basseterre valley district the months of April and May were dry and the cotton suffered severely with the result that at end of August picking had only commenced. The effect of the gale and heavy rains resulted in a loss of at least 60% of the crop, the total amount of cotton produced in St. Kitts being only 187,600 lb lint or at the rate of 120 lb. lint per acre.

NEVIS.

A report of the industry in Nevis is given in the report of the Agricultural Instructor of that Island. The season was again a most unfavourable one, the return of lint per acre being the lowest on record averaging about 28lb. lint per acre.

ANGUILLA.

Owing to the presence of the Pink Bollworm, and unfavourable seasons cotton growers in this small island took little interest in the industry with the result that no cotton was planted for the season. It is hoped that this holiday from planting cotton may lead to a decrease in the Pink Bollworm and that a larger acreage will be put in during the coming season. The close season has been fixed for the months of April and May so that cotton will be planted with the first rain in June.

RETURN OF AGRICULTURAL PRODUCE EXPORTED FROM THE PRESIDENCY OF ST, KITTS-NEVIS FOR THE YEAR ENDED DECEMBER 31st 1924.

Article.	Quantity.	Value £
Sugar...	9,699 tons	201,989
Molasses	207,314 Gallons	2,716
Cotton	260,043 lb. lint	24,766
Cotton seed	80 tons	625
Cotton seed oil	2,711 Gallons	383
Coconuts	244,145 nuts	1,526
Salt	1,161 tons	952
Copra	11,263 lb.	177
Hides		250
Horses	50	871
Mules...	106	1,207
Asses	63	79
Cattle...	16	51

DETAILS OF ADMINISTRATION

EXPENDITURE, RECEIPTS, SALES OF PLANTS ETC.

The Expenditure for the year was as follows :—

	£	s.	d.
Salaries (including commission on profits of Cotton Farm Cotton Inspectors)	1,236	10	0
Upkeep Botanic Station	218	0	3
Sugar Cane, Cotton and other Experiments	274	17	2
Experiments Nevis	117	4	7
Contingencies	6	2	11
Apparatus & Chemicals (Laboratory)	125	6	0
Contingencies (Laboratory)	14	16	8
Destruction Wild Cotton & Cotton Pests	127	14	9
Horse Allowances (Curator and Agric. Instructor)	76	0	0
Travelling Expenses (Agric. Supt. to Nevis)	14	0	6
Travelling Expenses Cotton Inspectors	28	0	0
Telephones	34	4	0
Cultivation Government Cotton Farm	653	18	4
Hedge round Cemetery Nevis	6	18	11
British Empire Exhibition	99	18	9
Tobacco Expert Salary	100	0	0
Passage to Jamaica	24	9	6
Cultivation Tobacco and making Cigars	202	19	1
	3,361	1	6

RECEIPTS.

La Guerite Economic plots	154	18	8
Sale of Cigars and Tobacco	79	14	4
Botanic Station sale of plants	3	4	8
Nevis Experiment Station (sale of produce)	29	5	11
Government Cotton Farm	111	4	7
Total Receipts	378	8	2

The cotton crop from the Government Cotton Farm and the Experiment Station remained unsold at the end of financial year.

Exports of Cotton.

The following table gives the exports of cotton lint from the Presidency in lb. for the twenty years ended September 30 1924

Year.	St. Kitts. lb.	Nevis. lb.	Auguilla lb.	Total. lb
1904	24,197	28.449	1,661	54,307
1905	78,219	114,721	31,452	254,392
1906	120,379	120,168	80,650	321,197
1907	180,917	96,402	61,666	338,985
1908	241,006	211,431	76,200	528,637
1909	207,146	104,250	49,320	360,716
1910	231,150	129,973	43,400	404,523
1911	329,322	344,395	148,595	822,312
1912	332,168	165,329	97,142	594,639
1913	374,594	166,477	112,138	653,209
1914	372,633	268,542	94,372	735,547
1915	397,567	305,154	33,750	736,401
1916	131,859	99,173	49,620	280,652
1917	106,265	196,915	49,399	352,579
1918	2,457	187,748	652	190,857
1919	442,681	307.212	47,869	797,762
1920	288,720	292,627	61,543	642,890
1921	23,970	422,120	nil.	446,090
1922	228,612	225,851	50,120	504,583
1923	29,256	510,919	nil.	540,175
1924	81,590	234,957	28,342	344,907

The crop return of Cotton for the year ending September 30, 1924 was 257,244 lb.

STAFF CHANGES.

There have been no changes on the Staff during the year.

CORRESPONDENCE AND DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS

The usual correspondence has been carried on departmentally in connexion with the work of the Department.

Copies of the Annual Report of the Agricultural Department and the Report on Experiments with Sugar Cane Varieties in the Leeward Islands have been distributed to persons interested in the Presidency.

The Agricultural and Commercial Society of which the Agricultural Superintendent is Honorary Secretary held nine meetings during the year the chief subjects of interest being :—

Visit of Sir Edward Davson who addressed the Society on Imperial Preference, Steamship and Telegraphic communication, Permanent Chamber of Commerce for the British West Indies and West Indian Currency.

Visit of D. H. Ross, Canadian Delegate. Resolution passed favouring closer trade relations with the Dominion of Canada.

Visit of Canadian delegation composed of Hon. J. H. Logan, Lt. Colonel Brown and Secretary. Mr Logan addressed the meeting and brought an invitation from the Premier of Canada for a meeting to be held at Ottawa early in the year to discuss trade relations between the Dominion of Canada and the British West Indies.

Resolution passed in appreciation of the services rendered by Sir Francis Watts, K.C.M.G., during his tenure of office as Imperial Commissioner of Agriculture for the West Indies.

STOCK

The Thorough-bred Stallion Sorghum imported by the Government in 1921 for improving the breed of horses on the island is still doing good service and is in good condition.

PUBLICATIONS RECEIVED

The following publications have been regularly received and are acknowledged with thanks :—

The Journal of the Imperial College of Tropical Agriculture, Kew Bulletin Journal of the Agricultural Society Jamaica, Report of the Local Agricultural Department Barbados, Report of the Mauritius Department of Agriculture with other publications, Report on the Agricultural Department Ceylon, Report on the Porto Rico Experiment Station and other publications, Journal de la station Agronomique, Guadeloupe. The Australian Sugar Journal, The Louisiana Planter, Facts about Sugar, Experiment Station Record, United States Department of Agriculture, Bulletins of the Experiment Stations United States Department of Agriculture, The Review of Applied Entomology, The Review of Applied Mycology, The Bulletin of Entomological Research, The annual reports of the Agricultural Departments in the British West Indies.

OFFICIAL VISITS.

Professor H. A. Ballou, M. Sc. Assistant Commissioner of Agriculture visited the Presidency in May 1924.

Hon. A. E. Collens visited the Presidency in October 1924, inspecting the Botanic and Experiment Stations and estates in different districts.

Dr. Melville T. Cook, of the Insular Station Parto Rico visited St Kitts-Nevis in October 1924.

EXHIBITIONS.

It having been decided that the Presidency was again to be represented at the British Empire Exhibition at Wembley, an exhibition committee was appointed by His Honour the Acting Administrator to collect and forward a representative exhibit of the resources of the Presidency. A grant of £100 was made for this purpose and for the purchase of suitable bottles.

At the end of March 1925 a representative collection of exhibits was forwarded to the Commissioner West Indian and Atlantic Section consisting of the following :—

ugar and its products, cotton lint, seed cotton, cotton seed oil, coconuts and copra, salt, castor seed, starches and meals, preserves, guava jelly, native bead work, native made hats and baskets. Collection of post card views, souvenir books of views of St Kitts-Nevis, handbooks of general information of the Presidency, large mounted photographs of places of interest in St Kitts, a collection of fancy needlework, bead work and guava jelly was sent on by the Women's Self Help Associntion for sale at the stall.

METEOROLOGICAL RETURNS.

Month.	Rainfall in Inches	Number of days on which rain fell.	Maximum fall in one day.
1924.			
April	2·73	11	·78 (27th)
May	4·02	15	1·39 (5th)
June	7·71	14	4·00 (27th)
July	4·59	7	·96 (29th)
August	20·17	8	14 93 (29th)
September	8·03	8	3·10 (25th)
October	2·89	6	1·03 (15th)
November	1·15	5	·35 (20th)
December	5·34	20	·90 (26th)
1925			
January	2·88	15	·70 (25th)
February	3·11	5	1·37 (15th)
March	·55	6	·16 (16th)
	63·02	120	

The rainfall for the year ending December 31 1924 was 63·02 inches which is 17·73 inches above the average for the last 22 years.

TEMPERATURE

Readings of the maximum and minimum thermometers and of the wet and dry bulbs are taken daily at 9 a.m. and 3 p.m. The mean monthly temperature was 78·5°. The maximum reading was 89° on March 31 and the minimum was 65° on March 10.

Corrected barometer readings are taken daily at 9 a.m. and 3 p.m.

A table is attached with the meteorological summary for 1924.

RAINFALL AT THE BOTANIC STATION, FOR THE LAST 23 YEARS.

Month.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.
January ...	...	0·92	3·51	2·15	2·25	1 45	1·29	7·31	2·44	4·98	2·60	6·67	3·37	2·34	3·82	1·76	1·01	2·80	5·04	6·49	2·5	1·99	3·13
February ...	...	1·30	2·01	2·41	1·61	1·99	1·81	2·85	1·27	4·51	1·40	4·06	2·76	1·64	3·62	2·81	4·71	2·00	2·97	3·97	1·95	1·18	3·02
March ...	...	1·83	2·03	1·43	2·57	0·67	5·50	1·92	1·71	2·30	1·15	2·94	1·87	0·48	3·13	1·32	3·11	1·99	1·49	3·61	2·13	3·67	·24
April ...	3·90	2·08	1·94	2·41	3·79	0·97	0·75	1·12	1·83	1·36	3·01	2·04	7·18	9·63	1·52	2·38	0·95	7·03	...	2·61	3·64	1·07	2·73
May ...	11·75	1·12	2·03	1·45	3·35	4·63	2·05	1·13	0·90	4·37	1·06	5·05	8·33	1·86	5·84	1·96	5·27	1·31	1·23	·91	·92	·07	4 02
June ...	4·76	2·43	2·19	5·20	9·39	2·80	2·86	5·62	3·45	2·25	2·86	0·82	3·19	3·19	3·21	5·55	1·68	3·41	3·08	1·27	2·2	3·74	7·71
July ...	4·59	2·23	3·89	3·40	1·86	2·57	3·39	4·46	1·64	3·31	2·59	1·97	5·07	11·21	8·23	2·77	2·33	7·96	2·16	4·07	3·23	2·84	4·59
August ...	1·31	1·23	6·95	3·23	0·58	2·15	6·44	8·13	4·47	2·18	2·09	3·19	2·05	5·22	8·23	2·75	2·63	2·46	3·45	3·02	4·64	4·21	20·17
September	4·22	4·22	8·38	5·03	18·36	2·42	3·98	1·99	8·51	3·49	7·61	4·73	1·85	4·39	4·01	6·71	6·79	3·72	4·11	4·40	8·09	3·64	8·03
October ...	2·80	7·46	3·75	3·63	2·50	10·77	4·33	3·01	3·74	4·92	7·13	3·93	3·61	4·81	15·89	2·79	5·15	8·00	4·59	6·58	3·10	7·25	2·89
November ...	7·36	3·78	2·25	3·75	3·51	1·86	7·99	6·92	4·20	3·02	8·80	4·28	8·96	7·27	5·94	1·93	8·96	4·84	3·67	3·35	2·18	·62	1·15
December ...	4·66	4·45	2·32	2·11	5·94	4·13	4·23	4·91	4·51	6·37	2·40	3·95	2·63	8 37	2·47	3·70	4·74	5·17	4·39	2·62	2·59	2·79	5·34
Total ...	45·38	36·05	44·62	36·10	55·71	36·41	44·62	49·79	38·67	43·09	42·89	43·63	50·87	60·11	65·94	36·43	47·33	50·69	36·18	42·90	37·21	33·07	63·02

Average for 23 years : 45·29 inches.

RAINFALL RETURNS FOR ST. KITTS FOR YEAR 1924.

	January	February	March	April	May	June	July	August	Setember	October	November	December	Total
Wingfield ...	5··9	5·94	2·40	2·41	5·98	7·71	7·43	21·82	8·75	5·98	3·18	8·06	85·07
Bellevue ...	2·60	4·01	1·64	2·37	3·45	6·61	6·19	19·16	10·41	8·75	9·79	5·89	80·85
Lodge ...	3·77	2 87	1·62	2·33	4·76	9·15	6·41	19·60	9·31	4·07	5·85	5 68	76·42
Belmont ..	2·70	2·28	·99	4 13	8·04	6·26	5·97	15·06	2·95	7·23	4·71	5·06	75·48
Bourkes ...	4·44	3·23	·71	3·22	5·41	8·03	8·68	18·20	5·96	8·20	2·39	6 93	75·40
Sir Gillies	5·25	2·85	3·10	3·50	7·55	5·95	8·75	14·05	8·35	8·00	2 80	5·20	75·35
Molineux ...	3·17	3·03	1·51	2 00	5·63	8·01	5·72	21·92	9·06	3·24	6 31	5·39	74·99
Mansion ...	3·12	4·14	1·89	1·58	5·20	6·34	5·21	21·91	8·59	4·57	7 01	5 05	74·61
Willetts ..	2·00	1·66	·78	4·53	7·13	8·36	5·56	17·05	10·89	7·58	5·50	3·16	74·20
Brighton ...	3·48	2·37	2·15	2·2·	5·26	8·10	5·93	20·29	7·13	4·09	5·77	6·48	73·34
Estridge ...	2·56	4·02	1·56	2 55	4 35	5·55	5·84	20·67	7·87	6·59	5·39	5·26	72·21
Brothersons	2·75	2·00	1·07	6 65	5·96	4·90	4·88	18·45	9·53	6·65	3·72	4·56	71·12
Lamberts ...	4·77	3·75	1·10	87	4·11	5·37	4·82	20·97	8·17	4·96	1·85	7·91	68·65
L: Bourryaus	2·90	3·02	1·52	2·10	3·93	5·56	5 94	18·61	8·34	4·83	4·04	6·84	67·63
Douglas ..	1·77	3·22		1·77	4·88	9·19	6·21	18·72	9·86	2·90	1·67	5·74	65·93
La Guerite ...	3·12	3·17	·29	2·30	4·85	7·62	4·72	20·71	8·57	3·34	·99	5·93	65·61
Caines ...	2·01	3·23	·68	2·07	4·41	5·65	5·47	18·47	8·79	4·67	4·41	4·84	64·97
Stapleton ...	2·72	3·17	50	1·33	4·33	7·58	4·11	21·58	8·27	2·54	2·66	5·69	64·48
Mills ...	2·69	2·99	1·38	2 05	4·60	5·62	4·23	20·70	7·90	4·28	4·72	2·95	64.00
Buckleys ...	2·82	3·09	·28	2·35	4·61	6·60	4·81	21·48	8·75	3 25	1·27	4·34	63·81
Cranstouns ..	3·07	1·80	1·51	5·89	2·58	8·16	5·23	18·65	4·41	2·29	2·38	5·31	63·28
Bot. Station	3·13	3·02	·24	2 73	4·02	7·71	4·59	20 17	8·03	2·89	1·15	5·34	63·02
West Farm...	2 43	4·39	·16	2·35	3·80	6 88	5·15	19·41	7·35	2·78	1·26	1·77	60·73
Frigate Bay	2·83	2·53	·30	2·17	4·30	8·07	4.47	18·94	6·17	3·40	2·97	2·88	59·03
Cunninghams	1·86	1·37	1·42	1·19	4·33	5·70	6·09	17·04	7·89	2·65	2·38	6·33	58·55
St. K Factory	1·71	2·91	·22	1·64	4·11	7·99	4·96	18·74	6·83	3·44	1·12	3·49	57·18
Pond ...	2·06	3 30	·35	1·55	4·30	6·01	5·85	15·15	8·75	2·05	2·30	5·05	56·72
Canada ...	1·82	2·11	1·88	·93	3·35	7·28	4·65	17·96	6·43	2·46	1·62	4·74	55·23

AVERAGE RAINFALL 1914—1924.

In	1914	the	average	rainfall	on 31	stations	was 55·92
	1915	„	„	„	32	„	„ 75·59
	1916	„	„	„	35	„	„ 69·51
	1917	„	„	„	33	„	„ 43·53
	1918	„	„	„	30	„	„ 52·44
	1919	„	„	„	29	„	„ 62·84
	1920	„	„	„	28	„	„ 37·80
	1921	„	„	„	29	„	„ 47·09
	1922	„	„	„	33	„	„ 44·72
	1923	„	„	„	31	„	„ 35·50
	1924	„	„	„	28	„	„ 68·13

The average rainfall for the 11 years is 53·91 inches so that the rainfall for the year 1924 is 14·22 inches above the average for that period.

AVERAGE MONTHLY RAINFALL 1924.

January	2·97
February	3·05
March	1·12
April	2·54
May	4·86
June	7·00
July	5·63
August	19·12
September	8·33
October	4·64
November	3·54
December	5·33
	68·13

Rainfall Return at the Weir Old Road Mountain, for 1923 and 1924.

1923 79·82 inches.

1924 115·52 inches.

METEOROLOGICAL SUMMARY, 1921 KEPT AT THE GOVERNMENT LABORATORY, LA GUERITE, ST. KITTS.

Month.	Thermometers (Fahr.)				Relative Humidity. per cent.		Thermometers.		Barometer Corrected		Rainfall	Barometer Corrected.		Thermometers	
	Dry.		Wet.						Reduced to 32° F. and Sea Level.						
	9 a.m.	3 p.m.	9 a.m.	3 p.m.	9 a.m.	3 p.m.	Maximum.	Minimum.	9 a.m.	3 p.m.		Highest	Lowest	Highest Max.	Lowest Min.
January	77·0	79·4	71·8	71·[illegible]	73·0	63·6	81·9	70·5	30·059	29·980	3·12	30·148	29·910	84	68
February	77·4	79·1	71·5	71·8	73·5	66·1	82·2	69·7	30·058	29·981	3·17	30·163	29·920	84	67
March	80·6	82·1	71·5	72·7	60·2	59·4	84·6	70·2	29·985	29·910	0·29	30·087	29·794	89	65
April	82·5	82·0	74·0	73·8	62·5	62·4	85·3	72·5	29·973	29·910	2·30	30·030	29·859	88	69
May	82·6	82·2	75·3	75·3	67·0	67·9	85·3	72·8	29·997	29·935	4·85	30·052	29·859	88	70
June	82·9	83·4	75·2	75·5	65·1	64·7	85·3	74·0	30·006	29·959	7·62	30·064	29·914	88	69
July	82·5	83·2	75·9	75·6	69·5	65·6	84·3	74·6	30·023	29·968	4·72	30·107	29·924	86	69
August	82·9	83·9	76·6	76·6	71·1	67·3	85·4	74·9	29·951	29·902	20·71	30·049	29·490	87	70
September	83·0	82·3	77.1	77·2	72·6	75·7	85·3	73·4	29·963	29·901	8·57	30·072	29·837	89	70
October	83·0	83·8	76·8	76·7	71·3	67 8	85·6	73·7	29·937	29·858	3·34	30·017	29·781	89	71
November	82·6	82·4	76·1	75·4	69·8	67·5	85·3	73·8	29·913	29·851	0·99	29·995	29·767	88	70
December	79·9	79·9	73·2	72·8	68·5	67·0	82·3	71·8	30·033	29·909	5·93	30·120	29·875	85	68
Means for the year	81·4	82·0	74·6	74·6	68·7	66·3	84·4	72·7	29·992	29·922	65·61				

Highest Maximum Temperature 89° on March 31st, Sept. 24th and 25th, Oct. 21st. Lowest Minimum Temperature 65° on March 10th. Highest Barometer (corrected) 30·163 on 7th February. Lowest Barometer (corrected) 29·490 on 28th August. Greatest Rainfall in 24 hours about 16 inchse on 29th August..

Hurricane.—A severe hurricane passed to the south of the island on the 28th of August. No great damage was done by the force of the wind, but considerable damage was caused by torrential rains which followed the storm.

REPORT ON WORK IN THE CHEMICAL LABORATORY

BY

R. E. KELSICK.

The following is a summary of the samples attended to :

Cane juices from estate experimental plots	139
Fancy Molasses	32
Milk (Police samples) ...	221
Water	2
Bird manure	1
Paris Green	2
London Purple	1
Coconut Cake	1
Linseed Meal	1
Rum	1
Cotton	12
Soils (physical analyses) ..	10
Soils (chemical analyses) ...	15
Soils (nitrogen & organic matter)	24
Soils (pH value)	12
Total	474 samples

ADDITION TO EQUIPMENT.

During the year an Aerogen weight-driven gas machine was installed in the Laboratory. This improvement of the equipment of the Laboratory has materially increased the working facilities.

MILK SUPPLY

During the year 221 samples of milk were submitted by the Inspector of Police for analysis and report. As usual the samples were obtained from vendors in Basseterre, in the country districts of St. Kitts and in Nevis.

Thirteen of these samples or 5·9 per cent were found to have been diluted with water. The percentage of adulteration ranged from 7·8% to 53%.

FEEDING STUFFS.

The feeding value of a sample of coconut cake received from one of the neighbouring West Indian Islands was determined in order to compare it with the oil meal used for feeding to estate animals. The present low prices of sugar compels estate owners to make every effort to reduce expenditure and it was thought that some economy might be effected by substituting coconut cake for oil meal. On analysis it was however found that, at the price quoted, the coconut cake was no cheaper than the oil meal owing to its lower protein content.

The following are the analytical results obtained :

	Coconut Cake.	Oil meal.
	%	%
Moisture	12·25	9·90
Crude Protein	19·25	29·94
Ether extract	8·89	8·62
Nitrogen free extractives ...	38·62	37·11
Crude fibre	15·92	8·58
Ash	5·08	5·85
	100·00	100·00
Nutritive Ration	1 : 3·1	1: 1·9
Food Units	109	134

INSECTICIDES

Two samples of Paris Green and one sample of London Purple were examined during the year. The majority of the planters now use Paris Green for controlling the cotton worm "Alabama argillacea" as more effective results are obtained than with London Purple.

Both samples of Paris Green were of very satisfactory quality, one sample containing 56·5 per cent. of arsenic as arsenious oxide and the other 55·7 per cent. The sample of London Purple contained 24·33 per cent. of arsenic as arsenious oxide and 1·65 per cent. as arsenic oxide.

Liming Experiment at Molineux Estate in 1924

The experiments carried out on Molineux estate in 1923 and reported on in the departmental report for that year were continued with the ratoon canes in 1924. Each plot received an application of sulphate of ammonia at the rate of 200 lb per acre in July. This year arrangements were made for the canes from each plot to be

weighed at the Basseterre Sugar Factory instead of the plan adopted in 1923 of weighing only the canes from a single row of each plot on the experimental weighing machine.

Table I gives the results for 1924 and Table II shows the mean results for 1923 and 1921.

TABLE I.

SHOWING RESULTS OF LIMING EXPERIMENTS FOR 1924.

RATOON CANES

No. of Expt.	Manurial treatment per acre	Yield in tons of cane per acre.	Mean.	No. lime =100
1	No Lime.	(1) 19·5 (2) 27·7	23·6	100
2	10 cwt. burnt lime	(1) 21·1 (2) 27·2	24·2	103
3	20 cwt. burnt lime	(1) 22·6 (2) 27·6	25·1	108
4	30 cwt. burnt lime	(1) 26·0 (2) 25·5	25·8	113
5	40 cwt. burnt lime	(1) 28·7 (2) 28·3	28·5	125
6	50 cwt. burnt lime	(1) 26·2 (2) 29·8	28·0	121

TABLE II.

SHOWING COMBINED RESULTS OF TWO YEARS 1923 AND 1924.

MEAN—ALL PLOTS.

No. of Exp.	Manurial treatment per acre.	Tons of Cane per acre. Mean all plots 2 years.	No. Lime =100
1	No Lime	25·9	100
2	10 cwt. burnt lime	28·0	108
3	20 cwt. burnt lime	28·2	109
4	30 cwt. burnt lime	28·9	11 2
5	40 cwt. burnt lime	31·7	122
6	50 cwt. burnt lime	30·8	1 19

From the mean results of the two series of experiments given in Table I it would appear that under the condition of this experiment, an application of two tons of burnt lime per acre has resulted in an appreciable increase in the yield of

cane, an increase of 4·9 tons of cane per acre being recorded. On the other hand, if the figures recorded for each series are examined separately it will be found that while there was a progresssive increase in yield for each application of lime in series I, no such proportionality is found to exist in the case of series II. This difference is probably due to a lack of homegenity of the soil of the field in which the experiment was laid out. The two control plots gave relative yields of 100 : 117 in 1923 and 100 : 142 in 1924. Samples of soil from these two plots were examined with the following results :

Control plots	Nitrogen.	Organic Matter.	Soluble in 1% Citric acid			Reaction pH value.
			Potash.	Phosphoric Acid.	Lime.	
	%	%	%	%	%	
Series 1 ...	0·105	1·94	0·009	0·017	0·196	6·8
Series 2 ...	0·117	2·20	0·006	0·022	0·180	6·6

It is impossible from these figures to suggest any explanation of the large difference in yield of the two no lime plots.

Table III shows the contents of nitrogen and organic matter of the plots for two years 1923 and 1924.

TABLE III

SHOWING NITROGEN AND ORGANIC MATTER CONTENTS OF PLOTS

No. of Expt.	Nitrogen		Organic Matter	
	1923	1924	1924	1923
	%	%	%	%
1	(1) 0·116	0·105	2·14	1·94
	(2) 0·100	0·117	1·97	2·20
2	(1) 0·094	0·108	2·22	2·20
	(2) 0·101	0·105	1·99	2·20
3	(1) 0·101	0·114	2·23	2·84
	(2) 0·104	0·111	2·03	2·71
4	(1) 0·094	0·117	2·02	2·28
	(2) 0·095	0·105	2·44	2·15
5	(1) 0·097	0·117	2·03	2·39
	(2) 0·090	0·097	2·46	2·63
6	(1) 0·097	0·100	2·24	2·38
	(2) 0·095	0·103	1·82	2·55

It is often stated that applications of lime generally cause a decrease of the soil organic matter ; this assertion is, however, not borne out by the figures recorded in the table.

Conclusions.

Considering only the mean results for the two years one might be inclined to advocate the use of lime under these particular conditions, but, taking the results of each series of the experiment separately, it seems possible that the differences recorded may be the result of variations in the fertility of the field as we proceed from north to south. The average estate yield for the whole of this field was 25 tons of cane per acre. Owing to the inevitable heterogenity of the soil it is difficult to draw definite conclusion from experiments conducted with plots of $\frac{1}{16}$ acre in area in duplicate. One method of overcoming this difficulty is to use small plots and to measure the variations of the soil by a great number of control plots adjacent to each of the trial plots.

From a study of the soils of the island it has been concluded that (1) the lowland soils, especially those of the Leeward districts, are in no need of lime (2) results from liming are only likely to be obtained on the upland soils in districts with a high rainfall.

THE SOIL OF ST. KITTS

In the follwing report an account is given of soil investigations carried out in the St. Kitts laboratory from time to time during the past eight years. The soil survey was begun in 1917 at the direction of Dr. H. A. Tempany, then Superintendent of Agriculture for the Leeward Islands, but it has not been possible to complete the work before. Some of the soil samples were taken by Mr. H. Waterland and the remainder by the writer. They represent average samples at the different points taken to a depth of nine inches.

PHYSICAL FEATURES AND CLIMATE OF ST. KITTS

The island of St. Kitts has an average width of about 5 miles, a maximum length of 19 miles and an area of 68 square miles. Its shape resembles that of a pear. The island is very mountainous, the axial part consisting of a lofty range separated into three distinct groups: Mount Misery (3,711 feet) Middle Mountain (3,000 feet), and the Olivees Range (3,000 feet). Everywhere from 1,000 to 1,200 feet to the sea level is a gently sloping glacis of detrital volcanic material, terminating in sea cliff which seldom exceed 50 feet in elevation. The volcanic glacis of the lower levels is traversed by deep ravines (ghauts or guts). The land is mostly under sugar cane and cultivation for this crop extends to as high as 1,000 feet on the windward side of the island. Above 1,100 feet the mountains are covered by virgin forest.*

*Reports on the Geology of St. Kitts-Nevis and the Geology of Anguilla by Kenneth W Earle, M.Sc., F.G.S.

The distribution of the rainfall throughout the island is shown in the following table:

TABLE 1. AVERAGE ANNUAL RAINFALL, ST. KITTS.

Name of Station.	Average annual rainfall (inches).	Number of years (average)	Approx. altitude (feet)	District.
Wingfield Manor	72·33	7	250	Leeward, upland
Brothersons	68·46	9	100	Windward
Cranstouns	67·31	6	70	Windward
Bellevue	57·15	7	100	Windward
Willets...	67·06	8	100	Windward
Molineux	65·96	9	300	Windward
Lodge	60·95	9	300	Windward
Brighton	60·93	7	230	Windward
Parsons	60·50	9	450	Windward
Estridge	60·12	9	100	Windward
Mansion	57·43	9	200	Windward
Stonefort	52·46	10	100	Leeward
Caines	52 06	9	20	Windward
Bourkes	48·86	8	90	Leeward
Buckleys ... ... —	48·61	8	200	Leeward
West Farm ... .. —	48·04	10	200	Leeward
Botanic Gardens	47·48	9	50	Leeward
Camp ... ... —	45·68	7	40	Leeward
Conaree	45·04	7	20	Leeward
Pond .. ... — ...	42·91	8	20	Leeward

It will seen that the Windward side of the Island, on the average, received more rain than the leeward.

The mean maximum temperature at La Guerite Experiment Station for the ten-year period 1915-24 is 83·3 F and the mean minimum 74·4 F. The mean relative humidity of the atmosphere for the same period is 69·7 at 9 a.m. and 68.6 at 3 p.m.

GEOLOGY*.

Geologically, St. Kitts belongs to the western or volcanic chain of islands of which Montserrat, Dominica and the southern and western parts of Antigua and Guadeloupe are representatives. The rocks composing it are largely identical

*Reports on the Geology of St. Kitts-Nevis and the Geology of Anguilla by Kenneth W. Earle, M.Sc. F.G.S.

with the volcanic (basement) rocks of Antigua, the difference being that, whereas in Antigua these basement rocks are overlaid by a great thickness of later sedimentary deposits, in St. Kitts these later deposits have been almost entirely obliterated by more recent volcanic ejectments or denuded from the surface before such eruptions took place. The island is practically entirely composed of volcanic eruptive rocks and their derivatives, consisting of an older foundation series largely obscured and obliterated by later volcanic ejectments, composed of cinders, ashes and boulders of the original basement rocks. Evidence is also seen in the Black Rocks that the later volcanic outbursts were accompanied by lava flows, while Brimstone Hill represents a secondary volcanic uplift on the flanks of Mount Misery.

The rocks of which St. Kitts is composed consist chiefly of hypersthene-andesite. The following rock systems have also been noticed agglomerates, tuffs and ashes; marine gravels, Brimstone Hill tuffs and limestone.

The following minerals have been identified plagioclase felspars (labradorite type), augite, olivine, magnetite and quartz.

Soils

The most important soils of St. Kitts are the talus soils which cover the foothills of the mountains. These soils are typically soils of transport. On account of their sandy nature they are badly washed during periods of heavy rainfall, the finer particles of the lower lands being carried into the sea and the lower levels receiving considerable material from the lands above them. They are generally of considerable depth, easily tilled and very fertile and consist partly of fine volcanic ash and partly of decomposed fragments of the older rocks. In table II the physical analyses of the soils examined are presented. An examination of the data contained in this table shows that in most cases the coarser particles are considerably in excess of the finer grades. With the exception of the sandy loams found in the western district of the island, the soils of St. Kitts are typically loamy sands. Owing to their extreme deficiency in colloidal matter these soils have a very low water holding capacity and growing crops are severely affected even in short period of drought. The following figures show the maximum water-holding capacities of some of the soils as determined by the method of Hilgard:

Name of Locality.	Maximum water-holding capacity (per cent)	Name of locality.	Maximum water-holding capacity
Lucas...	35·7	Conaree	44·3
La Guerite	33·9	Wingfield	43·5
Sir Gillies	52·8	Bayfords	40·5
Fahies...	46·2	Milliken	43·2
Molineux	40·9	Shadwell	40·0
		Olivees	27·8

The water-holding capacities of these soils can only be increased by the addition of bulky organic manures. More attention should be given to the bushing of lands and to the preparation of large supplies of pen manure.

It will be seen from the figures in table III that these soils contain only moderate amounts of nitrogen and organic matter. Owing to the favourable conditions which generally exist in tropical soils for bacterial action, the organic matter of these soils rapidly disappears and it is very essential for the maintenance of soil fertility that much attention be paid to the conservation and, where feasible, to the

increase of the soil organic matter. Also with an abundant supply of organic matter addition to the nitrogen content of the soil is likely to occur through the activities of free nitrogen-fixing bacteria of the Azotobacter type. Bacteria of this type were shown to be present in these soils by inoculating one gramme of fresh soil into 100 c.c. of S. F. Ashby's culture solution. In three duplicate tests the amount of nitrogen fixed was fonnd to be 0·39, 0.43, and 0.42 milligrammes of nitrogen per gram of soil per day. In the management of upland and hillside soils the problem of maintaining the supply of soil organic matter is a difficult one for the planter owing to difficulties of transport. As these lands are generally the poorest on the estate it would be a wise policy to reduce the acreage under sugar cane in these localities as low as possible and to give more attention to the lands more favourably situated for sugar cane culture. For upland and hillside soils the use of green dressing crops cannot be too strongly advocated. Besides increasing the supply of organic matter these crops will assist in checking to some extent the removal of the finest and richest fractions of the soil.

Chemically the St. Kitts soils are low in potash soluble in hydrochloric acid. In the lowland soils the potash seems to be present in a readily available form, but in some of the soils of the upper lands the availability of this is constituent low. The phosphoric acid content is also low but high in availability. The soils are deficient in calcium carbonate.

THE REACTION OF THE SOILS

As soil reaction is an important factor in soil fertility the reaction of certain of the samples has been determined. The results are given in table III. For its measurement the colorimetric method of Gillespie was used. The pH value ranges from 7·5 in the lowland soils to 6·6 in the soils of the upper lands. In one locality a pH value of 4·6 is recorded. This sample of soil was taken from a sloping field in a district of fairly heavy rainfall and its high acidity must have been the result of the removal of easily soluble bases by excessive leaching. In this case there was a definite response to liming. The lowland soils of the leeward district are distinctly alkaline in reaction although they contain only small amounts of calcium carbonate. With the heavier rainfall the soils of the windward district are generally slightly acid while the upland soils are still more acid. Although the lowland soils are deficient in calcium carbonate yet they contain a fairly high percentage of calcium in a readily exchangeable form. Evidently calcium compounds are being constantly removed from the upper lands and deposited at lower levels. This is indicated by the following figures:

Name of locality.	Approx. Altitude feet	%CaO 20% HCl	%CaO 4% HCl	%CaO 2% HCl
Bayfords ...	1000	1·69	0·196	0·104
Milliken ..	800	1·57	0·238	0·114
Shadwell ..	400	...	0.322	0·186
La Guerite ..	200	2·94	0·496	0·232

Recently the need of these soils for lime has been engaging attention and a series of liming experiments were conducted at Molineux Estate in 1923 and 1924. No positive results have been obtained from these trials. Some of our soils show a certain degree of unsaturation when examined by the Comber test, but they, however, contain appreciable proportions of available calcium, and recent soil investigations tend to show that response to lime is more probably connected with availability of soil calcium than with the actual saturation deficit. Consequently, our lowland soils are in no need of lime as they contain ample supplies of available

calcium. Certain of the upland soils may respond to applications of lime as their exchangeable calcium is somewhat low as well as their available potash and phosphoric acid.

SUMMARY.

1 St. Kitts is composed of volcanic material derived from igneous rocks chiefly hypersthene andesite.

2. Most of the cultivated soils are loamy sands, containing only moderate amounts of organic matter.

3. In most cases only very small quantities of calcium carbonate are present but the soils contain other compounds of lime of high availability.

4. In the leeward district the lowland soils are alkaline in reaction. Some of the soils of the windward district are slightly acid.

Methods used in the examination of the soils.

Mechanical analysis. The beaker method of Osborne was used The grades for the separated particles correspond to the standards adopted by the United States Department of Agriculture.

		Millimetres.
Coarse gravel...	...	5 to 2
Gravel ...	...	2 „ 1
Coarse sand ...	...	1 „ 0·5
Medium sand...	...	0·5 „ 0·25
Fine sand ...	...	0.25 „ 0·1
Very fine sand	...	0·1 „ 0·05
Silt ...	...	0·05 „ 0·01
Fine silt ...	...	0·01 „ 0·005
Clay ...	less than	0·005

Chemical analysis. Most of the determinations in the chemical examination were made by the methods employed in other soil investigations in the Leeward Islands (See Soils of Dominica by Francis Watts, I.D.A., 1902.) For the determination of carbonates the method recently employed is an adaptation of the method used at the West Virginia Agricultural Experiment Station. In this method the carbonates are decomposed by means of 1 : 10 HCl in vacuo in the cold. The carbon dioxide is expelled by means of a current of air and absorbed in standard sodium hydroxide solution. This method is preferable to heating the soil and acid mixture, as, where only very small quantities of carbonate are present, erroneous results are likely to be obtained from the action of the hot acid on the organic matter present in the soil.

Reaction. This was determined by the colorimetic method of Gillespie.

TABLE, II.

PHYSICAL ANALYSIS OF ST. KITTS SOILS.

Name of Locality.	Moisture.	Coarse Gravel	Gravel	Coarse Sand	Medium Sand.	Fine Sand.	Very Sand.	Fine Silt.	Fine Silt.	Clay	Organic matter & combin'd water.
Pond ...		6·3	9·3	13·2	33·0	4 9	2·7	3·3	21·0	2·5	4·1
Lucas ...	1·99	10·5	13·6	19·2	25·4		3·8	3·0	18·1	1·7	4·0
Douglas ...		11·5	15·5	11 6	24·6	5·1	0·7	1·5	21·5	2·2	3·9
La Guerite...	2·28	7·9	15·9	20·0	21·6	6·4	3 0	3·2	16·3	2·2	3·4
do	1·70	6·8	12·5	20·7	19·4	9·5	2·8	4·5	16·3	3·1	2·6
do	1·60	7 3	13·7	25·4	18·6	8·6	3 2	3·3	14·5	2·3	3·0
Buckleys ...		11·2	25·3	15·9	20·3	2·4	2·5	5·4	12·9	1·4	2·7
West Farm	1·90	15·3	20·3	13·6	18·2	2·7	3·3	5·8	14·5	1·5	3·3
Lamberts ...	2·17	11·8	12·7	10·8	19·7	8·0	5·2	5·2	20·1	1·3	3·8
Con Phipps	2·44	6·8	8·5	9·1	35·7	3·5	6 5	7·8	16·9	1·3	2·0
Chalk Farm	2·02	19·3	22·1	11·5	8·3	6·4	4·8	7·0	12·5	7·0	2·2
do	2·88	11·5	11·0	9·7	14·7	10·2	7·2	3·4	27·7	0·9	2·9
Bourkes ...	1·80	15 1	16·9	17·4	17·8	12·7	2·9	5·6	8·2	0·3	1·6
La Vallee ...	2·50	6·2	5·3	4·7	7·0	12·0	10·7	11·6	32·2	2·8	5·6
Sir Gillies ...	2·50	7·8	4·2	3·4	14 6		12·2	20·0	31·6	1·4	4·2
Fahies ...	3·80	9·1	5·4	5·0	18·1		7·1	13·9	34·8	2·6	4·9
Brothersons	1·80	17·3	11·5	8·1	16·2	9·9	5·2	7·2	18·3	1·2	4·0
do	2·30	9·5	8·7	9·4	19·5	13.8	5·7	5·9	19·5	1·5	4·6
Willets ...	2·40	4·9	6·9	14.9	16·5	8·8	4·8	7·0	27·3	1·8	5·5
Caines ...	1 50	5·3	10·3	13·0	25·3	12·7	7·1	3·9	16·5	1·2	3·7
do	2·90	3·1	6·6	8·7	21·5	12·8	10·2	7·4	23·1	1·7	3·0
Profits ...	2·90	8·5	8·7	14·2	17·4	7·4	4·2	6·2	25·6	1·9	4·5
Lynchs ...	3·38	17·1	7·9	13·9	20·8		4·5	7·5	21·4	2·4	4·1
Mansion ...	2·20	8·9	10·1	17·0	16·5	13·6	2·9	6·3	17·7	3·6	2·8
Molineux ...		16·7	18 0	11·0	15·2	2·2	4·1	13·2	14·1	1·3	4·2
Brighton ...		17·2	14·2	13·7	16·5	3·2	4·7	5·0	19·9	2·0	3·7
Conaree ...	2·93	6·5	7·6	19·0	27·0		1·3	3·1	29·0	1·6	4·0
Wingfield ...		8·9	3·2	8·1	24·8		2·5	7.9	30·4	6·9	7·4
Bayfords ...		17·7	13·3	16·3	21·6		4·6	4·6	12·1	6·2	3·3
Stapleton ...	2·00	4·7	9·5	19·3	28·8	11·5	2·9	3·5	15·4	1·5	2·2
Milliken ...	2·93	12·9	11·3	15·9	23·6		5·3	5·1	19·1	2·5	3·3
Shadwell ...	1·68	17·4	17·9	17·9	22·5		2·7	2·6]	14·3	1·9	2·2

TABLE III.

48 HOURS' DIGESTION WITH HYDROCHLORIC ACID (Sp. Gr. 1. 12.) SOLUBLE IN 1 PER CENT CITRIC

Name of locality.	Nitrogen	Organic Matter	Calcium Carbonate.	Insoluble Residue.	Potash K_2O.	Phosphoric Acid P_2O_5.	Calcium Oxide CaO.	Magnesium Oxide. MgO.	Oxide of Iron Fe_2O_3.	Oxide of Alumina Al_2O_3	Potash K_2O	Phosphoric Acid. P_2O_5.	Lime CaO	Reaction pH value
Pond	0·129	3·72	...	...	...	...	...				...	...	...	...
Lucas	0·106	...	...	...	...	...	...	...	...	...	0·023	0·029	0·316	7·1
Douglas	0 108	3·27	...	...	...	...	...	...	...	..	...	...	...	...
La Guerite ...	0·064	1·48	...	...	...	...	...	...	...	...	0·012	0·008	...	7·4
do ..	0·076	1·44	0·04	76·57	0·13	0·09	2·94	0·54	5·14	8·11	...	...	...	...
do ...	0·106	2·21	...	...	0·12	0·10	1·26	0·29	4·58	4·73	...	...	...	...
Buckleys	0·084	1·53	0·04	8·153	...	...	...	...	...	...	0·009	0·011	...	7·0
West Farm ...	0·109	2·35	0·05	...	...	...	...	...	...	...	0·021	0·023	...	7·1
Lamberts ...	0·123	3·28	0·03	...	...	...	...	...	...	...	0·024	0·020	...	7.3
Con Phipps ...	0·092	2·44	0 06	...	...	...	...	...	...	...	0·012	0·029	...	...
Chalk Farm ...	...	...	50·00	...	...	...	...	...	...	...	...	...	...	...
do do ...	...	...	18·00	...	...	...	...	...	...	...	...	...	...	...
Bourkes	0·092	2·86	0·08	...	...	...	...	...	...	...	...	...	...	...
La Vallee ..	0·151	2·97	nil	...	...	...	...	...	...	...	0·039	0 058	...	4·6
Sir Gillies ...	0·134	2·88	0·03	...	...	...	...	...	...	...	0·032	0·052	0.347	7·5
Fahies	0·140	2·57	...	72·65	0·14	0·04	2·50	0·13	3·39	8·50	0·015	0·007	0·311	6·7
Brothersons ...	0·095	2·55	0·09	...	...	...	...	...	...	...	0·037	0·033	...	..
do	0·143	2·77	0·07	...	...	...	...	...	...	...	0·033	0·033	...	...
Willets	...	...	0·06	...	...	...	...	...	...	...	0·033	0·042	...	...
Caines	0·115	2·13	nil	...	...	...	...	...	...	...	0·024	0·018	...	...
do	0·115	2·56	0·10	...	...	...	...	...	...	...	0·032	...	...	...
Profits	0·123	2·74	0·05	...	...	...	...	...	...	...	0·022	0·027	...	...
Lynchs	0·090	2·27	0·01	77·21	0·06	0·03	1·89	0·24	4·19	6·95	0·006	0·015	0·127	6·8
Mansion	0·106	2·03	0·02	...	...	...	...	...	...	...	0·012	0·023	...	...
Molineux	0·162	2·66	0·01	...	...	...	...	...	...	...	0·024	0·013	...	6·7
Brighton	0·087	2·17	nil	81·03	0·07	0·04	1·50	0·08	4·23	7·33	0 020	0·017	...	...
Conaree	0·081	1.98	0·40	...	...	...	...	...	...	...	0·013	0·038	0·441	7·5
Wingfield	0·137	2·08	0·08	66·17	0·22	0·02	1·34	0·41	6·06	13·96	...	...	...	6 6
Bayfords	0·070	2·19	...	75·85	0·06	0·02	1·69	0·18	5·30	9·02	...	...	...	6·8
Stapleton	0·137	2·72	...	...	...	...	...	...	...	...	...	...	...	...
Milliken	0·095	2·36	...	78·76	0·02	0·06	1·57	0·07	3·79	8·12	0·005	0·012	0·168	...
Shadwell	0·070	1·37	nil	...	...	...	...	...	...	...	0·008	0·018	0·197	6·7

Report of the Agricultural Instructor, Nevis,

FOR THE YEAR ENDED MARCH 31ST 1925.

Work in the Nursery, and Distribution of Plants

CONDITION OF GARDEN, NURSERY, &c.

The ornamental border of Allamanda is making good progress, and so far has proved a suitable plant for the border, as it stands the dry conditions well and is also very ornamental.

The border hedge of bread-and cheese has been kept regularly trimmed.

The stock of nursery plants has been kep up, but there has been very little demand for plants.

The total number of plants distributed from the Station during the year under report was 54, which consisted of ornamental plants and shade trees supplied to Government House and the Alexandra Hospital.

Plant Importation.

There was only one consignment of seed received at the Station during the year which consisted of two packets of Sesame seed from Trinidad.

Plot Experiments at the Experiment Station.

Experiments have been carried out with various economic and food crops, such as sweet Potatoes, Yams, Cassava, Onions, Indian Corn, Cotton, Ground nuts, and Peas and Beans.

Experiments on a larger scale were also carried out with Sea Island Cotton Castor Seeed, Sweet Potatoes and Indian Corn on lands rented from Wards' Estate.

Seeds and cuttings of the above crops were freely distributed to grower throughout the Island.

The following is a list of such distribution :—

Sweet Potatoes	46,670 Cuttings
Cassava	Nil.
Onions slips	30,700
Cotton Seed	241 lbs.
Indian Corn	186 „
Para Peas	6
Ground Nuts	43 „
Onion Seed	19 „
Castor Seed	445 „
Black Eye Peas	294 „
Bread-and-Cheese Seed ...	14 „

PLOT A.

This plot was previously in sweet potatoes. After the sweet potatoes were reaped the plot was prepared and planted in Mazzagua Guinea Corn on April 3rd 1924. The germination was fairly good but the weather following was dry and much against the crop and it was not until the middle of July that the crop began to make good progress.

The crop was not seriously affected by the hurricane of August 28th as the plants were low, and the crop benefitted a great deal from the heavy rains which followed.

The crop was reaped on December 23rd 1924 and a return of 70lb. of threshed corn obtained, being at the rate of 700 lb. per acre.

The corn stalks were turned under and the plot planted in ten varieties of sweet potatoes on February 17th 1925. The weather following was dry and the crop made a very poor start.

PLOT B.

This plot was previously in onions. After the onions were reaped the plot was planted in Lima Beans as a green-dressing. The green dressing was turned under on August 8th 1924 and half of the plot bedded and prepared for sowing tobacco seed, The seed germinated well but the seedlings were all destroyed by the hurricane of August 28th. The plot was holed and planted in Black Eye Peas on September 24th. This crop was badly attacked by a stem borer and was turned under very early. On November 27th 1924 the plot was replanted in Black Eyes with seed obtained from the Jamaica Agricultural Society. This crop did fairly well and a return at the rate of 150 lb. of dry peas per acre was obtained. After the Black Eyes were reaped the plot was bedded and planted in Native peanuts on March 3rd 1925.

PLOT. C.

This plot was previously in sweet potatoes. After the sweet potatoes were reaped the plot was planted in Sesamum on banks 4ft. wide and 1 ft. apart on the bank, on June 30th 1924. On account of the dry weather the germination was not very good. and extensive supplying was carried out on July 24th 1924. The crop was seriously damaged by the hurricane of August 28th, and later

by the green bug (Nezara) which caused a great deal of damage to the seed in the capsules. Picking began on December 11th 1925, and the total amount of seed reaped from the plot was 5 lb; being at the rate of 50 lb. per acre. On January 5th 1925 the crop was pulled off and the plants turned under.

PLOT D.

This plot was planted in Cassava on 9th October 20th 1923. The crop was severely attacked by the cut worm (Prodenia) during the month of November, and later from the effects of the dry weather. The crop was reaped on June 30th 1924. and as was expected gave very poor returns.
The following table gives the result of the experiment :—

VARIETY.	YIELD PER PLOT LB.	CALCULATED YIELD PER ACRE LB.
Brazier's	18	1,020
Black Stick	2	170
French No. 3	20	1,132
Red Greenaway	2	113
Small Leaf	8	680
Blue Top	4	340
Sweet No. 1.	1	85

After the cassava was reaped the plot was bedded and planted in two varieties of pea-nuts e.g. Caroline Runner and Native, on July 4th 1924. The germination was fairly good and the crop met favourable weather.

The crop was reaped on December 15th 1,924 and the yields are as follows :—

Caroline Runner at the rate of 1,150 lb. per acre.

Native at the rate of 1200 lb per acre.

After the peanuts were reaped the plot was holed and planted in Sesamum on January 14th 1925. The germination was fairly good but the crop turned out a failure on account of a severe attack of aphis and the dry weather.

PLOT E.

This plot was previously in Eddoes, which crop failed on account of unfavourable weather. The plot was planted in Indian Corn on August 26th 1924. The weather was favourable and the crop gave a return of 132 lb. of corn on the cob, being at the rate of 1,320 lb. per acre. The crop was reaped on November 21th 1924. After the corn crop was reaped the plot was bedded and planted in onions on December 1st 1924. This crop did fairly well, and was free from pests except the onion worm (Prodenia) which was kept under control by hand-picking. Reaping began on February 18th 1925 and a return of 987

lb. of onions obtained, being at the rate of 9,870 lb per acre. The crop was all sold in the local market, but the price obtained was low.

PLOT F.

This plot was previously in onions. After the onions were reaped the plot was planted in Black Eyes on May 5th 1924, but on account of the dry weather only a poor crop of peas was obtained. The plot was planted in Para peas on October 7th 1924. This crop also did badly. A trench was dug between the hedge and this plot, and deep cultivation was given the plot. It was replanted in Para peas on December 17th 1924, but only a very poor return of peas was obtained. The pea bush was turned under along with a fairly heavy application of pen manure.

PLOT G.

This plot was planted in selected castor seed. The weather following was unfavourable and the germination was very poor. Many of the plants which came up were afterwards killed by the dry weather which followed. The plot was replanted in June 1924 and and a fairly good stand was obtained, but the plants were all destroyed by the hurricane of August 28th 1924. The plot was re-planted and planted in ten varieties of sweet potatoes on October 8th 1924.

The weather following was favourable and the crop turned out well.

The following table gives the results of the experiment :—

VARIETY.	YIELD PER PLOT IN LB.	CALCULATED YIELD. PER ACRE IN LB.
Man France	144	12,960
Todd	79	14,220
Brass Canon	38	6,840
Harriss'	126	11,340
Hug-me-tight	189	17,010
Red Hen and Chicken — ...	93	8,370
Caroline Lee	99	8,910
Red Bourbon	115	10,350
Spooner	113	10,170
Pity the-poor ... — ...	112	10,080

The crop was reaped on February 10th, 1925.

PLOT H.

This plot was previously in peanuts. After the peanuts were reaped the plot was prepared and planted in selected cotton on February 5th 1924. An account of the selection will be found on another page of this report under the head "Cotton Selection."

After the cotton crop was reaped the plot was bedded and planted in Onions on November 20th 1924. The weather was favourable and the crop turned out fairly well. Reaping began about the middle of February and a return of 1,251 lb. of onions was obtained ; being at the rate of 12,510 lb. per acre.

DEMONSTRATION PLOTS.

Plot H. Cotton & Sweet Potatoes.

This plot was previously in cotton. The cotton was pulled off and burnt and the plot planted in Egyptian Bon-Avis as a green-dressing. The green dressing was turned under on January 2nd. 1924, and the plot planted in cotton of the type No. 205, on February 5th. 1924.

The seed germinated well, but the weather following was most unfavourable. The plants were all stunted, and began to blossom when they were only 1ft. high The bearing was scant, and a fair proportion of the bolls was lost through boll-shedding on account of the continuous dry weather.

The crop was slightly attacked by the cotton worm (Alabama argillacea.) The pink boll worm (Pectinophora gossypiella) was not very prevalent during the picking season, and the first crop was all reaped without any appreciable damage by this pest.

Picking began on May 28th 1924 and a return of 493 lb. of seed cotton obtained, being at the rate of 493 lb. per acre.

The crop took on a new growth during the month of July, but this was completely destroyed by the hurricane of August 28th 1924. The cotton plants were pulled off and burnt and the plot prepared and planted in Sweet Potatoes on September 15th 1924. The weather following was favourable and a return of potatoes at the rate of 4,028 lb. per acre was obtained. The crop was reaped by January 24th 1925, and sold in the local market at a time when potatoes were most needed.

After the crop of potatoes was reaped the plot was planted in Sea Island Cotton of the type No. 205 on February 16th 1925. The seed germinated fairly well but the weather following was dry and the crop is making very poor progress.

PLOTS B. C. & D. CASTOR SEED.

The yields from these plots up to March 31st 1924 have been published in last year's report.

The crop was continued for subsequent pickings, but the experiment was seriously affected by the long spell of dry weather, and many of the plants died, especially those nearest the hedge. After the rains of July 1924, the plants took on a new growth and were again looking promising, but they were badly damaged by the hurricane of August 28th 1924. They however soon recovered and took on a vigorous new growth later a fairly good crop was reaped. Picking continued until the middle of March 1925 when the experiment was discontinued as a large proportion of the plants died out from the effects of the dry weather and attack from the White Scale insect.

The following table gives the results of the experiment.

Plot.	1st picking at end of 4 mths. lb. unshelled seed.	Subsequent pickings lb. unshelled seed.	Total yield from plot in 16 mths lb. unshelled seed	Calculated yield per acre in 16 mths. unshelled seed lb.
B	602	810	1,412	2,824
C	677	720	1,397	2,794
D	569	834	1,403	2,806

The experiment was carried out under most unfavourable weather conditions and very much higher yields would be obtained under better conditions.

Plot E Indian Corn.

This plot was previously in Castor Seed. The castor seed plants were cut down and buried under and the plot planted in Indian Corn on November 29th 1924. The seed was obtained from the Jamaica Agricultural Society. The germination was very good. About the middle of December the crop was attacked badly by the corn worm (Heliothis). Later the dry weather came on which seriously affected the crop. The crop was reaped on March 3rd 1925 and a yield of 124 lb. of corn on the cob obtained; being at the rate of 248 lb. per acre. Some very fine ears were however obtained which have been kept for planting.

The corn stalk was buried under and the plot prepared for Sea Island cotton.

Cotton Selection.

Seeds from the three types—Nos. 2,051, 2,052, & 2,953 were planted in plot F. on February 5th 1924. The seed germinated well but the dry weather came on and seriously affected the development of the plants.

No individual selection was carried out this season but the seed cotton from the different types was reaped and kept in separate bags to carry on the selection.

Work In Connection With Insect and Fungus Pests and their Control.

Sugar Cane.

Mosaic disease of the sugar cane is now hard to find, and but for the difficulty in discovering it in peasants' plots the disease might be completely eradicated. On the estates it is an easy matter to go through fields of S/C 12/4 cane and rogue out all plants with mosaic disease, but mosaic disease has been discovered in peasants plots in which there were just a few S/C 12/4 canes along with other varieties. The disease is hard to find on the estates, but now and again one comes across the disease in small plots about the island. The disease so far has only been found on the S/C cane, and measures for its control and eradication are continued.

The Moth Borer (Diatraea Saccharalis) was not very prevalent this season.

COTTON.

The cotton worm (Alabama argillacea) was very severe during the early part of the season and a great deal of damage was done by this pest to the cotton in the windward part of the island during the months of May and June 1924. Most of the damage done was due to the planters not having a sufficient supply of Paris Green and lime on hand. Leaf-blister mite (Eriophyes gossypii) was not very plentiful during the early part of the season, but the new growth which came out in September was severely attacked.

The Cotton Stainer (Dysdercus andreae) was hardly seen during the season and this pest is now fairly well under control. In some parts of the island the native food plants of this pest which had been cut down are springing back and will very soon prove a source of continuity.

The Pink Boll Worm (Pectinophora Gossypiella) was very mild in its attack up to the end of picking of the early crop, but the late planted and second crop were severely attacked.

The cleaning of the cotton fields has not been as satisfactory as in the past. The cotton fields were nearly all abandoned after the hurricane of August 28th 1924, and were over run by grass and weeds, which made it almost impossible to have the fields thoroughly cleaned.

Some of the estates were assisted by a loan from the Local Government to clean up cotton fields.

The cleaning up of the store houses, and the fumigation of cotton seed at the ginneries have been satisfactorily carried out. If the cotton fields and store houses are all properly cleaned up, and all cotton seed fumigated, the loss from pink boll worm in the first crop would be very slight, provided all the cotton is planted at about the same time; as late cotton would be as severely attacked by the pink boll worm as a second crop.

INSECTICIDES.

A supply of Paris Green was again put in stock by the local Government for the benefit of the smaller growers under the same arrangements as in the past.

During the season 164 growers were supplied with Paris Green and the total quantity of Paris Green supplied was 2,176 lb.

DISINFECTION AND FUMIGATION OF PLANTS AND SEEDS.

In accordance with the provisions of the Plant Protection Ordinance, 20 consigments of seeds consisting chiefly of vegetable seeds were received at the Experiment Station for fumigation. Five shipments of cotton seed were made to Barbados. The seed was first fumigated with carbon bisulphide at the ginneries as soon as it came from the gin. It was again fumigated at Charlestown under the supervision of the Agricultural Instructor, just before shipment. The seed after being fumigated was taken directly from the fumigating house and shipped.

The same two fumigating houses at Charlestown were again used this season.

Experiments with Sugar Cane Varieties.

Experiments with the following varieties of canes were carried out at Cane Garden and Round Hill estates in connection with the work at the experiment station :—B. 147, B. 376, B. 6388, Ba. 6032, Ba. 7924, B.H. 10(12), B.S.F. 12 (24) B.S.F. 12 (27), B.S.F. 12 (34), B.S.F. 12 (45), K. 6, K. 12, K. 15, K. 19, K. 33, Hill Seedling, S/C. 12/4, White Transparent. The Plot at Cane Garden was planted on April 1st 1924 and that at Round Hill on April 16th 1924.

The plants germinated fairly well in both plots but the dry weather which continued up to the middle of July was very much against the experiment. The

plots were not damaged by the hurricane of August 28th 1924 and rather benefitted by the heavy rains which followed.

The plot at Cane Garden was reaped on April 22nd 1925 and that at Round Hill on May 4th 1925. At Cane Garden the highest yield was obtained from K.33 which yielded at the rate of 14·9 tons of canes per acre, followed by Ba. 7924 with 14.6 tons per acre: At Round Hill the highest yield was obtained from S/C. 12/4 which yielded at the rate of 12.5 tons of canes per acre, followed by B.S.F. 12(45) with 12.1 tons per acre.

The canes were cut and weighed in the field under the supervision of the Agricultural Instructor and a sample of 50 lb. of canes was taken from each variety and sent to the Government Laboratory at La Guerite, St Kitts, for analysis of the juice.

The results of these experiments are published in a separate report by the Government Chemist and Superintendent of Agriculture for the Leeward Islands.

Progress In The Chief Industries

Sugar

There has been no progress in the sugar cane industry Only a small acreage was planted and most of it by peasant growers.

The crop suffered much from want of rain during the long period of dry weather

Very little damage was done to the crop by the hurricane of August 28th. 1924, and it greatly benefitted by the heavy rains which followed. From August on the crop made rapid progress and the returns were a trifle better than they had been for some time past.

While it may be said that the growing crop benefitted by the hurricane, the machinery of the island suffered serious damage and several of the boats which took canes across to the St. Kitts Factory were lost. Repairs were done to the machinery in order to reap the crop, but the repairs were more or less inadequate, consequently the crop was reaped under great difficulties, and there was much waste through trouble with machinery ; and the sugar made was often of very poor quality.

Efforts were made to induce capitalists to erect a Central Factory in the island, but with no success. It is doubtful whether it would be possible to grow sufficient canes in any one section of the island to suffice a large factory and in order that sufficient canes may be obtained it would be necessary to have extensive rails over difficult country. It would appear that two small factories, one in the Charlestown district and one in the Gingerland district, would be a more sound proposition, entailing less capital outlay and a comparatively small working expenditure.

The acreage under canes for next crop is about the same as that for last crop, but on account of the dry weather the crop is making poor progress.

Cotton.

The acreage under cotton during the season under report was about 2,500 acres. The greater part of the crop was planted during the month of February. The seed on the whole germinated well, but the dry weather which followed seriously affected the crop, and except in the northern part of the Island, the fields all had to be practically replanted and as late as the middle of July the crop in many places had not been established.

The cotton worm (Alabama argillacea) made its appearance during the month of April, but its attack was most severe during the months of May and June when in the northern part of the island, a great deal of damage was done to the crop.

The pink boll worm (Pectinophora gossypiella) was very slight in its attack during the first picking, and there was every prospect of the early crop being reaped without any appreciable loss by this pest. The hurricane of August 28th 1924 did serious damage to the cotton crop. The late planting was completely destroyed, while practically all the bolls and unpicked cotton in the early fields were lost.

The crop in some places took on a new growth but this was severely attacked by leaf-blister mite. In some fields, especially peasants' plots, the cotton was pulled off and ground provision planted, but the greater part of the crop was left standing, and as no further attention was given the fields grass and other weeds very soon grew rank between the cotton.

Practically no cotton was reaped after the hurricane, and the average yield for the island was at the rate of 24 lb. of lint per acre which is the poorest on record.

The cleaning up of the cotton fields had not been as satisfactory as in the past as many of the cotton fields were abandoned after the hurricane and were overrun by grass and other weeds which made a thorough cleaning up a difficult matter.

The acreage under cultivation for next crop is very small, only about 500 acres the greater part of which was planted during the month of February 1925. The seed germinated fairly well but the crop suffered much from want of rain and is making very poor progress.

Cocoanuts.

The coconut plantations suffered heavy losses from the hurricane of August 28th 1924, through loss of trees, nuts and blossoms. At Pinneys estate about 2000 bearing trees were destroyed and 300 at Stoney Grove, and the effects of the hurricane will be felt for some years. At Clifton's and Jones estates the effects of the hurricane were less severe. At Pinneys estate plants are being raised to fill the places of those destroyed by the hurricane.

The younger crop at Pinneys and Paradise was not much damaged by the hurricane.

There was no increase in the acreage under cultivation during the year, and the plantations were all healthy and bearing fairly well up to the time of the hurricane.

Progress in Minor Industries

Onions.

Orders were received at the experiment station for 25 lb. of onion seed. The seed arrived during the latter part of September and were immediately delivered to the growers.

The crop was planted during the months of October and November. The weather was favourable and the crop turned out fairly well.

Very few of the larger growers are now growing onions, and it is interesting to note that there is an increasing number of small growers planting onions each year. The small grower is very successful with his plot and finds a ready market locally for his onions.

The Onion Growers Association has not been in operation for some seasons as the crop now grown is too small and a ready market is found in the Presidency for what onions that are now grown.

Provision Crops.

Special attention was paid this year to the growing of provision crops, and during the months of October and November a fairly large acreage was planted in sweet potatoes, peas and Indian corn, chiefly by peasant growers. The weather was favourable and the crops did fairly well. In some parts of the island the cut-worm (Prodenia) did a fair amount of damage to the corn and peas crop.

The yam crop however was a small one on account of scarcity of cuttings.

Castor Seed.

The cultivation of castor seed was tried on a fairly large scale on several of the estates, chiefly Powell's, Bush Hill, Bath Plain, and also by some of the peasant growers, but on none of the estates have the results been encouraging.

At Bath Plain sixty acres were prepared and planted in castor seed. The crop was all planted by the middle of June 1924 The seed germinated fairly well but the whole crop was practically killed out by the dry weather which followed. The cut worm (Prodenia) also did a great deal of damage to the young plants. The pest was in a measure kept under control by hand picking, and on some days as much as four gallons of worms were collected.

The crop was replanted and by the early part of August there was a good stand of young plants the crop on the whole looking fairly promising. The hurricane came on August 28th. 1924 and serious damage was done to the crop The larger plants were nearly all killed by being blown about by the wind and a large number of the young plants were either washed away by the heavy rains or died from being too long under water. The field were again replanted and by the middle of November the crop was looking fairly promising. Picking began in January 1925 and a return of 18,667 lb. of unshelled seed obtained being at the rate of 311 lb. per acre. The crop was continued for a second picking but practically all the plants died out during the dry weather.

At Powell's estate 18 acres were planted in castor seed. The seed germinated fairly well but the crop was badly damaged by the cut worm and later, by the dry weather. A return of 4,082 lb. of unshelled seed was reaped being at the rate of 226lb. per acre.

At Bush Hill estate 36 acres were planted in castor seed. This crop was also badly affected by the cut worm and unfavourable weather conditions. The total weight of unshelled seed reaped was 2,808 lb. being at the rate of 78lb. per acre. Several of the small growers also tried castor seed and the returns were also very poor.

On the whole it cannot be said that the trials with castor seed have turned out a success, but on the other hand the weather conditions through which the experiments were carried out were most unfavourable. Growers however are unfavourably impressed with the castor seed industry and it is not likely that the cultivation would be continued.

Live Stock.

There was no outbreak of disease among the animals, and the live stock of the island continue in good health and condition.

The hurricane caused very little loss among the larger animals, but there was a very heavy loss of pigs, goats and sheep, chiefly by the heavy rains which followed the hurricane.

The Kentucky Jack continues in good health and condition and is doing good service.

Extension Of Interest In Agricultural Matters.

EXHIBITIONS.

No Agricultural Show was held during the year, but a collection of articles representing the produce of the island was forwarded, through the St. Kitts Agricultural and Commercial Society. to the Wembley Exhibition.

The exhibits consisted of the following:—Sea Island cotton lint, native Muscovado Sugar, Molasses, Coconuts, Copra, Native made baskets, and native seeds as used in seed work.

It is proposed to hold an Agricultural Show during the coming year.

AGRICULTURAL EDUCATION

There is great lack of interest shown in school gardens, and very little work of any value is being carried on in them.

Details of Administration.

CORRESPONDENCE AND DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS.

The usual correspondence in connexion with the work of the Department has been carried on.

Regular visits are paid by the Agricultural Instructor to the estates and peasants cultivation in the different parts of the island and advice as to crops and dealing with pests ffered.

The Agricultural and Commercial Society of which the Agricultural Instructor is Honorary Secretary held fifteen meetings during the year and the following were the chief matters discussed:—

Medical Service of the island; Condition of the island on account of the hurricane; Loan to planters; Central Factory for the island; Close Season for Cotton; Daily Mail Service between St. Kitts and Nevis; Canadian West Indian Steamship Service; & Remission of Taxes.

PUBLICATIONS RECEIVED.

The following Publications have been regularly received and are hereby gratefully acknowledged :—

The Journal of the Imperial College of Tropical Agriculture; Journal of Agricultural Research, and the Experiment Station Records, United States Department of Agriculture; Journal of the Empire Cotton Growing Corporation; Journal of the Agricultural Society, Jamaica; Journal de la Station Agronomique; Guadeloupe; Report of the Local Department of Agriculture, Barbados; Phillippine Agricultural Review; Report of the Experiment Station, Porto Rico; Pine Apple Growing, Federal Agricultural Department Antigua.

REPAIRS TO BUILDINGS.

Slight repairs had to be done to the office after the hurricane. The other buildings are in fairly good repairs.

STAFF CHANGE.

There was no change of staff during the year.

OFFICIAL VISITS.

Hon. A. E. Collens F I C., F C S., Government Chemist and Superintendent of Agriculture for the Leeward Islands visited the station in October and again in November.

Hon. W. Wigley, the Acting Administrator, visited the station twice during the year.

Mr F. R. Shepherd the Agricultural Superintendent St. Kitts-Nevis visited the station several times during the year, and gave valuable advice on agricultural matters in general.

METEOROLOGICAL RETURNS.

The total rainfall for the year 1924-25 was 57·97 inches which is 26·75 inches more than that of last year. Rain fell on 139 days during the year; the heaviest fall recorded for any one day was 20·00 inches which occurred on the 29th of August 1924.

The following tables show the monthly rainfall at the Experiment Station for the year under report, and for the past nineteen years :—

Month.	Rainfall Inches.	No. days on which rain fell.	Max. fall for any one day.
April	2·49	8	1·18 (28th)
May	1·58	12	·35 (16th)
June	2·48	10	·58 (10th)
July	4·50	16	2·12 (19th)
August	24·35	11	20·00 (29th)
September	4·05	12	1·11 (12th
October	5·11	9	1·40 (5th)
November	3·57	15	·59 (5th)
December	4·71	22	·98 (14th)
1925.			
January	2·65	10	·44 (29th)
February	·99	8	·27 (16th)
March	1·49	6	·34 (4th)
	57·97	139	

RAINFALL AT THE EXPERIMENT STATION, FOR THE PAST NINETEEN YEARS, 1906—1924.

Months.	1906. Ins.	1907. Ins.	1908. Ins.	1909. Ins.	1910. Ins.	1911. Ins.	1912. Ins.	1913. Ins.	1914. Ins.	1915. Ins.	1916. Ins.	1917. Ins.	1918. Ins.	1919. Ins.	1920. Ins.	1921. Ins.	1922. Ins.	1923. Ins.	1924. Ins.
January ...	3·28	3·22	2·58	3·86	5·24	6·38	3·84	7·18	3·40	4·40	4·53	1·39	2·18	2·22	3·71	5·84	1·75	1·51	2·46
February ...	2·22	2·32	1·70	3·46	3·82	2·78	·68	1·96	2·74	2·13	3·99	3·28	3·27	1·16	2·86	2·79	1·80	2·41	3·29
March. ...	1·71	1·23	7·16	·96	1·33	2·32	2·66	4·14	3·10	·28	2·19	2·57	2·75	1·33	1·25	3·86	4·71	5·42	·05
April ...	2·49	1·08	2·18	2·72	·11	4·02	4·20	·81	2·52	5·65	·75	1·00	2·59	2·79	·02	1·40	3·33	2·04	2·49
May ...	3·49	3·30	4·24	1·62	1·08	4·08	·79	4·47	6·29	2·79	3·82	4·27	6·14	2·10	1·22	·82	1·95	·45	1·58
June ...	7·30	4·12	2·83	9·52	4·21	·92	2·51	2·23	2·65	2·52	2·07	6·73	2·02	2·29	2·22	·80	3·09	5·62	2·18
July ...	4·11	4·86	3·34	4·52	2·80	2·72	3·56	1·77	5·16	8·14	14·54	3·46	4·08	4·02	1·79	4·94	4·05	1·85	4·50
August ...	2·94	2·64	5·02	8·71	7·10	2·34	3·46	4·92	4·72	4·34	7·81	4·02	5·12	1·66	4·61	6·58	3·88	2·63	24·35
September ...	18·93	3·76	6·98	3·46	7·00	5·30	3·19	3·59	2·20	4·71	2·00	8·18	6·21	2·10	6·05	4·20	6·84	1·16	4·05
October ...	3·10	6·92	1·44	7·38	1·86	3·58	5·25	3·89	4·17	5·88	10·86	5·00	6·36	8·44	6·76	7·34	4·27	5·28	5·11
November ...	3·42	2·54	6·93	2·11	3·32	2·80	6·43	4·41	12·44	5·37	6·74	2·11	10·98	7·22	3·30	3·66	2·14	1·23	3·57
December ...	6·67	7·46	6·10	2·74	4·68	8·84	2·85	3·36	4·16	5·89	4·74	2·09	2·28	2·89	4·39	3·95	5·81	3·16	4·71
Totals ...	60·11	43·45	50·50	50·69	41·91	46·08	39·42	42·64	53·55	52·10	64·04	44·10	53·98	38·22	38·18	46·18	43·62	32·76	58·64

The average rainfall for the last nineteen years was 47·37 inches.

Temperature.

Readings on the maximum and minimum and the wet and dry thermometers are taken daily at 9 a.m. and at 3 p.m.

The mean monthly temperature was 83·2 F. The minimum reading was 61 F. registered on February 9th 1925, and the maximum 90 F. on May 10th 1924.

Hurricane.

A fairly severe hurricane struck the island during the early morning of August 28th 1924. A great deal of damage was done to houses chiefly those of the labouring class, and crops. The lowest Barometer reading was 29·45.

Publications on Sale

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FOR THE WEST INDIES

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Volume VII, Nos. 1, 2 3, and 4—Containing Papers on General Subjects, especially cotton.
Volume XVIII. Nos, 1, 2. 3, and 4—Containing Tropical Agricultural College Committee's Report and Papers on Miscellaneous Subjects.

PAMPHLET SERIES.

The folowing list gives particulars of the chef pamphlets issued by the Imperial Department of Agriculture that are still available :—

SUGAR INDUSTRY.

Seedling and other Canes at Barbados, 1900-4.
Seedling Canes and Manurial Experiments at Barbados.
in 1903-5, No. 40. in 1904-6, No. 44,
in 1905-7, No. 49, in 1906-8, No. 59,
in 1907-9 No. 62. in 1908-10 No. 66. } price 6d each.
Seedling and other Canes in the Leeward Islands.
in 1900-1, No. 12. in 1901-2; No. 20,
in 1902-3, No. 27, } price 2d. each.
in 1903-4, No. 33, in 1904-5, No. 38
in 1905-6, No. 46, in 1906-7, No. 50,
in 1907-8, No. 56 } price 4d. each.
in 1908-9, No 63, in 1906-10, No. 67—price 6d each
Manurial Experiments with Sugar cane in the Leeward Islands.
in 1902-3. No. 30, in 1903-4. No. 39,
in 1904-5 No. 42. n 1905-6. No. 47,
in 1906-7. No. 51, n 1907-8, No. 57, } price 4d. each,
n 1908-9, No. 64, in 1909-10, No. 68,
Sugar-cane Experiments in the Leeward Islands.
in 1910-11 price 1s. ; price 1s.

SCALE INSECTS.

Scale insects of the Lesser Antilles Part I. No. 7 price 1s.
Part II No. 22, price. 4d.

GENERAL.

(43) Cotton Seed and Cotton-cake-meal on West Indian Plantations. Price 2d.
(52) Hints for School Gardens. Price 6d.
(60) Cotton Gins. How to erect and work them. Price 4d.
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